Revue suisse Zool.	Tome 84	Fasc. 2	p. 279-296	Genève, juin 1977

Stomatopod Crustacea in the Muséum d'Histoire naturelle, Geneva

by

Raymond B. MANNING

With 1 figure and 1 table

Abstract

Thirty one species of stomatopods are represented in the collections of the Muséum d'Histoire naturelle, Geneva. Many of the species, some from poorly sampled islands of the western Indian Ocean, Réunion and Mauritius, were accompanied by unusually perceptive study notes prepared by Leo Zehntner before 1900. The collection includes one specimen of the common Mediterranean *Squilla mantis* which suggests that the species may include two or more distinct populations.

In 1971 I visited the Muséum d'Histoire naturelle at Geneva during a study tour of European museums. During that visit I was able to identify most of the Indo-West-Pacific stomatopods in that collection, and, as a result of that trip, the description of a new stomatopod from Mauritius was prepared (Manning 1974). Also during that visit, Dr. Bernd Hauser and I discussed the possibility of preparing a catalog of the stomatopods in the collection, similar to reports on decapod groups prepared by Türkay (1971*a*, 1971*b*, 1974). The first visit was too brief to complete the catalog, but I was able to return to the museum in 1974 to examine the remainder of materials in the collection. This report is a result of those two visits.

The stomatopod collection at Geneva contains only 31 species, but it is of some interest in that much of it was assembled during the tenure of Henri de Saussure and much of it had been studied by Leo Zehntner, a preparator at the museum from 1890-1894. Many of the specimens were accompanied by handwritten study notes [1] prepared by Zehntner, all of which (except for that referring to *Manningia zehntneri*, which accompanied the description of that species (Manning 1974)) are reproduced here. Zehntner was an excellent observer, and, as can be seen from studying his notes, he was in many ways ahead of his time in his understanding of specific characters in the

[1] Pour des raisons d'objectivité, nous avons conservé l'orthographe et le style des citations de L. Zehntner, qui était de langue maternelle allemande, ce qui explique les fautes de français. (La rédaction.)

stomatopods. Unfortunately, he was not able to publish his observations. So far as I can determine, he published but one paper (ZEHNTNER 1894) on the stomatopods in the collection. All four species reported in that paper are present in the collection. HAUSER (1972) has published a biographical sketch of Zehntner.

Although the stomatopod collection at Geneva is small, it includes numerous representatives from the poorly known islands of the western Indian Ocean, Réunion and Mauritius, as well as some species from Madagascar and Indo-Malaya. In spite of this, perhaps the most interesting find in the collection is a specimen of *Squilla mantis* from the Mediterranean which differs from typical representatives of that species in several characters, suggesting that *S. mantis* may include more than one species; Zehntner, too, noticed the differences.

In the list of species given below, I have not attempted to give a complete list of references. Citations are given for the original description and regional monographs, as well as to a good illustration. Usually the total length is indicated, but in some cases dried specimens could not be measured. For the squillids, I have tried to indicate the corneal indices wherever possible. The accounts also include brief notes on morphology, or nomenclature, as appropriate, and the study notes of Zehntner are included.

I wish to thank Dr. Hauser and the administration of the Muséum d'Histoire naturelle for generously supporting my second visit. My studies on the systematics of stomatopods have been supported by the Smithsonian Institution through its Research Awards Program, and my second visit to Geneva was supported by the Foreign Currency Program of the Smithsonian. The illustrations were prepared by my wife Lilly.

Family GONODACTYLIDAE Giesbrecht, 1910

Echinosquilla guerinii (White, 1861)

Gonodactylus guerinii White, 1861: 43, pl. 7.
Protosquilla guerinii. — BROOKS 1886: 75, pl. 16 figs. 1, 6.
Gonodactylus guerini. — KEMP 1913: 192.

Material: Mauritius (Robillard): 1 ♀, 55 mm.

Distribution: Indo-West-Pacific region, from scattered localities between Japan and the western Indian Ocean.

Gonodactylus bredini Manning, 1969

Gonodactylus bredini Manning, 1969*a*: 315, figs. 87, 88.

Material: Antilles: 1 ♀, 31 mm. Guadeloupe (Desbonne): 2 ♂, 37-58 mm (in 2 lots).

Distribution: Western Atlantic Ocean, from Bermuda southward through the Antilles to the northern coast of South America.

Gonodactylus chiragra (Fabricius, 1781)

Squilla chiragra Fabricius, 1781: 515.
Gonodactylus chiragra. — ZEHNTNER, 1894: 212 [part]. — KEMP, 1913: 155, fig. 2, pl. 9 fig. 107.

Material: Amboina (Bedot & Pictet): 3 ♂, 67-83 mm.

Distribution: Widely distributed in the Indo-West-Pacific region, from Japan and Oceania westward to the western Indian Ocean and the Red Sea.

Gonodactylus falcatus (Forskål, 1775)

Cancer falcatus Forskål, 1775: 96.
Gonodactylus glabrous. — Brooks 1886: 62, pl. 14 fig. 5, pl. 15 figs. 7, 9. — Kemp, 1913: 167, pl. 9 fig. 113.
Gonodactylus graphurus. — Zehntner 1894: 213.

Material: Samoa: 1 ♀, 59 mm. Amboina (Bedot and Pictet): 4 ♀, 24-70 mm. Trincomali, Ceylon: 2 ♀, 30-38 mm. Mauritius (Robillard): 1 ♂, 28 mm; 1 ♀, 35 mm. ? Red Sea (Lordet): 1 ♂, 33 mm; 1 ♀, 34 mm.

Remarks: Apparently Zehntner believed that this species was not distinct from *Gonodactylus graphurus* Miers, 1875 (see Ingle 1971), or was to be considered as a varietal form of that species. The following notes accompanied the specimens:

"Carène médiane du 6e segm. très bien prononcé. Nous sommes arrivé au *Gonodactylus graphurus* de la forme typique." (Along with the two specimens from the Red Sea.)

"Chez ce crust., on observe la 1re trace du carénule méd. du 6e segm. abdom. Cela nous conduit directement à *G. graphurus*." (Female from Samoa.)

"Ces deux spécimens répondent très bien à la description de *G. glabrous*, Brooks: Chall. Rep. p. 62. Cette esp. de Brooks n'est qu'une variété de *graphurus*, comme le dit de *Man: Arch. f. Naturg.* 1887 [1888] pag. 573 et 574. En effet, on trouvera dans la série d'individus, que je détermine comme *graphurus* des passages entre le *glabrous* et cette dernier esp."

"Chez ces individus on observe pour la 1re fois que les carènes subméd. du telson sont bien séparées de la médiane. La carénule méd. sur le 6e segm. complètement absent. Doigt de la patte raptatoire allongé et cymoidal." (Comments on the specimens from Ceylon.)

Although *G. falcatus* is now considered to be a variable, widely distributed species, it is possible that it is actually a species complex. Zehntner recognized some differences, which might prove to be important, in the materials available to him. Serène (1954) has discussed the occurrence in Viet Nam of two distinct forms of *G. falcatus*, one of which he identified with var. *ternatensis* de Man. If further study shows that *G. falcatus* comprises more than one species, the following names are available:

Gonodactylus glabrous Brooks, 1886: Samboangan Reefs, Philippines.

Gonodactylus glabrous var. *ternatensis* de Man, 1902: Ternate, Molucca Islands.

Gonodactylus chiragra var. *mutatus* Lanchester, 1903: Furnadu Velu, Miladumadulu Atoll; Hulule, Male Atoll; and Goidu, Goifurfehendu Atoll (all western Indian Ocean).

Gonodactylus glaber var. *rotundus* Borradaile, 1907: Coetivy, Seychelles Islands; Zanzibar.

Gonodactylus bossorotundus Roxas and Estampador, 1930: Cebu: Philippines.

Distribution: Widely distributed in the Indo-West-Pacific region, from Japan and Hawaii to the Red Sea.

Gonodactylus lanchesteri Manning, 1967

Gonodactylus lanchesteri Manning, 1967*a*: 11, fig. 4.

Material: 1 ♀, 31.5 mm (without locality data).

Distribution: Western Indian Ocean, from scattered localities between the Red Sea and South Africa.

Gonodactylus oerstedii Hansen, 1895

Gonodactylus oerstedii Hansen, 1895: 65 [footnote]. — Manning 1969*a*: 325, fig. 89.

Material: Antilles: 1 ♂, 29 mm. Guadeloupe (Desbonne): 2 ♂, 1 ♀ (not measurable).

Remarks: Zehntner apparently recognized the distinctness of the American *G. oerstedii* from its Indo-West-Pacific relatives as a result of the examination of the few specimens available to him. He compared the American specimens (representing two species, *G. bredini* and *G. oerstedii*) with a small series of *G. platysoma* and *G. smithii*, both of which he identified as *G. chiragra*. With the exception of *chiragra*, all of the species mentioned above were to be recognized as distinct at some later dates, the last, *bredini*, having been described in 1969. Zehntner's notes on the three specimens from Guadeloupe show that he recognized the characters subsequently used by Hansen to separate *G. oerstedii* from *G. chiragra*, and all of the Indo-West-Pacific species related to it, namely the presence of an accessory carina on the inner margin of the intermediate carinae of the telson. The notes accompanying the specimens from Guadeloupe read as follows:

"Cette série de crust., étiquetés comme *G. chiragra*, est très importante. Elle présente une variation de la dite esp. qui forme un passage à une espèce encore inconnue (à ma connaissance) qui corresponderait à *G. graphurus*. En effet un examen attentif montrerait que la série est parallèle avec celle que nous avons déterminée comme présentant des aberrations de *chiragra*, provenant de mers Pacifique. Chez les crust. américains, nous observons aussi, que la carène médiane du telson se prépare à donner naissance à deux carènes submédianes, comme nous les avons chez *G. graphurus*. Ce fait est aussi accompagné d'un allongement du doigt de la patte raptatoire, comme nous l'observons en passant de *G. chiragra* à *G. graphurus*. L'allongement des épines de la plaque externe du telson est moins frappant de même que la tendance des tubercules du 6e segment à devenir plus grêles."

"La différence la plus importante qui nous empêche pour le moment de ranger ces crust. sous: *chiragra*, c'est la présence de 2 carènes sur les épines interméd. du telson. Chez *chiragra* et *graphurus* on en observe une seule sans compter la marginale."

"Outre les différences que j'ai déjà fait observer (entre les *Gonod.* américaines et *chiragra*) c'est une tendance prononcée de perdre les spinules des tubercules sur les 2 derniers segments abdominales. Aussi, je ne peux pas constater les petits spinules mobiles au bord des dents submédianes du telson."

The latter paragraph was in a note which accompanied the lot containing both *G. bredini* and *G. oerstedii.*

Distribution: Western Atlantic, from southern Florida through the Antilles to northern South America; tropical eastern Pacific region (Schmitt 1940).

Gonodactylus platysoma Wood-Mason, 1895

Gonodactylus platysoma Wood-Mason, 1895: 11, pl. 3 figs. 3-9.
Gonodactylus chiragra var. *platysoma*. — Kemp 1913: 162, text-fig. 1.

Material: Samoa: 1 ♂, 48 mm; 1 ♀, ca. 67 mm. Pacific Ocean (Melly): 1 ♂, 73 mm; 1 ♀, 73 mm. Madagascar: 1 ♂, 59 mm; 1 ♀, 66 mm. Mauritius (Robillard): 6 ♀, 47-70 mm. Réunion (de Saussure): 1 ♂, 66 mm; 1 ♀, 52 mm. No data: 1 ♂, 1 ♀.

Remarks: In his original account of this species, Wood-Mason did not provide a description but did give excellent figures. He based the species on materials from two lots, one from Mauritius and one from the Society Islands; he noted that the lot from Mauritius was the type. Kemp, 1913: 163 indicated that three specimens from the Andaman Islands were the types, but this designation was in error as those specimens were not reported by Wood-Mason. The type-locality is Mauritius and there are 2 female syntypes in the collections of the Zoological Survey of India (Indian Museum).

Distribution: Indo-West-Pacific region, from the central Pacific to the western Indian Ocean.

Gonodactylus smithii Pocock, 1893

Gonodactylus smithii Pocock, 1893: 475, pl. 20B fig. 1.
Gonodactylus chiragra. — Zehntner, 1894: 212 [part] [not *G. chiragra* (Fabricius, 1781)].

Material: Amboina (Bedot & Pictet): 1 ♀, 34 mm. Reunion (Sikora): 1 ♂, 31 mm. Madagascar: 1 ♀, 35 mm. Mauritius (Robillard): 3 ♂, 33-39 mm; 3 ♀, 35-46 mm (in 3 lots).

Remarks: In all of these specimens the anterolateral angles of the rostral plate are acute, sharp, but not spiniform, as in the male lectotype of *G. smithii* figured by Holthuis (1967: fig. 7*c*).

The following note accompanied two of the males from Mauritius: "Plaque médiane du telson montrant les premiers traces des 6e épines marginales. Le tubercule médiane de la dite plaque devient gros et elle se prépare à donner naissance aux carènes submédianes chez *graphurus*. Ce fait est accompagné par un allongement des épines de la plaque extérieure du telson, comme nous le verrons pour les formes suivantes qui font le passage à *Gonod. graphurus*, White et *glabrous*, Brooks."

Zehntner commented about a female as follows: "offrant un progrès dans la séparation des carènes submédianes, dérivent de la médiane. Les petites dents lat. sont plus aigües, que chez les specimens ci-dessus," and about a single male: "cet individu montre un peu plus frappant l'aberration notée pour les spécimens précédents."

Apparently these remarks were based primarily on the inflated median carina of the telson in the males, which in these specimens is so swollen that the short accessory medians are not visible.

Distribution: Indo-West-Pacific region, where it has been recorded from localities in the western Pacific Ocean through to the western Indian Ocean.

Haptosquilla lenzi (Holthuis, 1941)

Protosquilla glabra Lenz, 1905: 388, pl. 47 fig. 13.
Gonodactylus glaber. — Kemp 1913: 182, pl. 10 fig. 121. — Serène 1947: 385, fig. 1, pl. 2.
Gonodactylus lenzi Holthuis, 1941: 288 [replacement name for *G. glaber* (Lenz), preoccupied].

Material: 1 ♀, 24 mm (without data).

Remarks: In my account of some new gonodactylid genera (MANNING 1969*c*), figure 6, which represents *Chorisquilla excavata* (Miers, 1880), was labelled *Chorisquilla lenzi* in error. The species renamed by Holthuis (1941) belongs in *Haptosquilla*, not *Chorisquilla*.

Distribution: Indo-West-Pacific region, from the Philippines to the western Indian Ocean.

Haptosquilla pulchella (Miers, 1880)

Gonodactylus trispinosus var. *pulchellus* Miers, 1880: 122.
Gonodactylus pulchellus. — KEMP 1913: 177, pl. 10 figs. 117, 118.

Material: 1 ♂, 18.5 mm (without locality data).

Distribution: Indo-West-Pacific region, from scattered localities between Australia and the western Indian Ocean, including the Red Sea.

Haptosquilla stoliurus (Müller, 1886)

Gonodactylus stoliurus Müller, 1886: 477, pl. 4 fig. 2. — KEMP, 1913: 184.
Protosquilla stoliura. — ZEHNTNER 1894: 213.

Material: Amboina (Bedot & Pictet): 1 ♀, 51 mm.

Distribution: Indo-West-Pacific region, from Western Australia and the Malay Archipelago to the Philippine Islands.

Manningia zehntneri Manning, 1974

Manningia zehntneri Manning, 1974: 69, fig. 1.

Material: Mauritius (Robillard): 1 ♂, 49 mm, holotype.

Distribution: Known only from Mauritius.

Odontodactylus scyllarus (Linnaeus, 1758)

Cancer Scyllarus Linnaeus, 1758: 633.
Odontodactylus scyllarus. — KEMP 1913: 135. — MANNING 1967*b*: 10, fig. 3.

Material: Mauritius (Robillard): 1 ♂, 146 mm; 1 ♀, 139 mm. Mauritius: 4 dry specimens.

Remarks: The following note was with the specimens: "chez les 3 ♀ les carènes des 2 derniers segments abdominales sont sensiblement plus grêles (minces) que chez les 4 ♂ et le plus souvent pourvues d'épines."

Distribution: Indo-West-Pacific region, from Japan to the western Indian Ocean.

Pseudosquilla ciliata (Fabricius, 1787)

Squilla ciliata Fabricius, 1787: 333.
Pseudosquilla ciliata. — KEMP 1913: 96. — MANNING 1969*a*: 264, fig. 74.

Material: Upolu: 1 ♀, 74 mm. Reunion (Sikora): 3 ♀, 49-63 mm. Mauritius (Robillard): 2 ♀, 52 mm. Indian Ocean (Boissard): 1 ♀, 95 mm. Guadeloupe (Desbonne): 1 ♀, 62 mm.

Remarks: The specimen from Upolu was identified with *S. quadrispinosa* Eydoux & Souleyet, a synonym of *P. ciliata* based on an abnormality, bifurcated submedian spines on the telson. The right submedian tooth is bifurcated in the specimen from Upolu; the other tooth is normal.

Distribution: Widely distributed in the Indo-West-Pacific region, from Japan to the western Indian Ocean and from localities on both sides of the Atlantic.

Pseudosquilla hieroglyphica Manning, 1972

Pseudosquilla hieroglyphica Manning, 1972: 2, fig. 1.

Material: Madagascar: 2 dry specimens, 72-83 mm.

Remarks: These specimens are clearly ornamented with light spots on the propodus of the claw and the characteristic color pattern of the carapace also is visible.

This is the first authenticated record of this species from the western Indian Ocean. As I pointed out in the original account, a specimen from Mauritius identified with the closely-related *P. ornata* by BIGELOW (1894) could be identified with *P. hieroglyphica*, but the source of the material was suspect. That record probably can now be accepted.

Distribution: Indo-West-Pacific region, from several Pacific localities and from Madagascar and Mauritius in the western Indian Ocean.

Pseudosquilla megalophthalma Bigelow, 1893

Pseudosquilla megalophthalma Bigelow, 1893: 101. — KEMP 1913: 103. — DOLLFUS 1959: fig. 9.

Material: Mauritius (Robillard): 1 ♂, 37 mm.

Distribution: Indo-West-Pacific region, from the central Pacific to the western Indian Ocean.

Pseudosquilla oculata (Brullé, 1837)

Squilla oculata Brullé, 1837: pl. unique fig. 3 [atlas]; 1839: 18 [text].
Pseudosquilla oculata. — KEMP 1913: 102. — MANNING 1969*a*: 271, figs. 75-76.

Material: Mauritius (Robillard): 1 ♂, 34 mm. Madagascar: 1 ♂, 54 mm. Guadeloupe (Desbonne): 1 ♂, 3 ♀.

Remarks: That Zehntner could distinguish three closely-related species of *Pseudosquilla*, *P. ciliata*, *P. oculata*, and *P. ornata*, based on the limited material reported here, is quite clear from the following note which accompanied the specimen from Madagascar:

"BROOKS (Chall. Report on the Stomatopoda, pag. 55) semble croire, que le *Pseudosquilla oculata* puisse être seulement une variété de *Ps. ciliata*. Tout en avouant, que le genre *Pseudosquilla* devrait être révisé. Les 2 esp. citées sont très bien séparées, à conclure de notre material. Quant à *Ps. ornata* (Heller) Miers elle a été bien séparée de oculata par *Miers:* Ann. Mag. nat. Hist. (5) V, 110+111. Seulement j'ai à ajouter, que chez nos *Ps. oculata* les épines latérales du 6[e] segments abdominales sont proportionellement plus longues que chez *ornata*, tandis que chez Miers, c'est inverse, si ses figures sont exactes. Quant à la séparation de *Ps. oculata* et *Ps. ornata* d'un côté, et de *Ps. ciliata* de l'autre côté, je fais observer suivant, chez *ciliata* la plaque rostrale est carrée, aussi longue que large ou à peu près comme ça. Chez *oculata* et *ornata* elle est presque du double plus large que longue. Chez *ciliata* les yeux sont cylindriques, en

tout sens; chez les autres espèces ils le sont vus d'en dessus; ils sont latéralement déprimés donc plus haut que *ciliata*, si l'on voit de profil. Sur la carapace de *ciliata* point de tache circulaire des deux côtés. L'épine sur l'angle post.-lat. du 5e segment abdominal chez *ocul.* et *orn.* est tout simplement un prolongement de cet angle; chez *ciliata* on trouve une échancrure du bord post. du dit segment au dessus de l'épine. Enfin les épines du 6e segm. abdom. surtout les épines submédianes sont beaucoup plus courts chez *ciliata* que chez *oc.* ou *ornata*."

Distribution: Widely distributed in the Indo-West-Pacific region and on both coasts of the Atlantic.

Pseudosquilla ornata Miers, 1880

Pseudosquilla ornata Miers, 1880: 111, pl. 3 figs. 5, 6. — Zehntner 1894: 213. — Kemp 1913: 100.

Material: Amboina (Bedot & Pictet): 1 ♀, 44 mm. Samoa: 2♂, 33-50 mm.

Distribution: Indo-West-Pacific region, from Japan to the western Indian Ocean.

Family Lysiosquillidae Giesbrecht, 1910

Coronida trachura (von Martens, 1881)

Gonodactylus trachurus von Martens, 1881: 93. — Miers 1884: 16, pl. 1 figs. 3, 3*a*.
Coronida trachura. — Kemp 1913: 130.

Material: Madagascar: 1 ♂, ca. 41 mm.

Remarks: This specimen agrees with Kemp's account in all respects. Zehntner also recognized the affinity of this species with *Coronida bradyi*, as evidenced by the following notes:

"Se rapproche évidemment de *Squilla bradyi*, Edw. Fonds de la mer, p. 137, pl. 1F. 11. Miers: Ann. Mag. nat. Hist. (5) V: 117. J'ai seulement vu cette dernière notice, qui n'est pas assez complète. Le spécimen d'Edw. est de la Maghelanstrasse (Baie de Vincent)."

"Le 3e art. de l'appendice foliacé des antennes est considérablement plus long chez notre crust. que chez celui de Edwards."

"De cette espèce, je n'ai pas vu la descript. de *v. Martens. Sitzber.* der *Gesellsch. naturfors. Freunde* zu *Berlin*, n° 6 p. 93 1888? [1881]. Si la figure de Miers: P.Z.S., 1884 pl. 1 fig. 3 est correcte, notre individu en diffère sensiblement par la forme de la carapace, du rostre la 1re ayant les bords lat. moins courts le bord ant. moins longs. Le sillon cervical beaucoup plus fortement prononcé. Le rostre est moins long en proportion de sa largeur, presque un mm. plus large que long. La crête s'élève de la face plane du rostre et ne se prolonge pas sur toute la longueur du rostre. La figure de Miers le montre (le rostre) de la forme d'un toit. Quant aux 2 derniers segments abdominales la figure citée ne donne pas assez de détails pour reconnaître l'espèce avec sûreté. Le crust. en question offre des rapports avec le *Protosquilla* à cause de la forme des derniers segm. abdom., avec les *Gonodact.* à cause du doigt rapt. gonflé, à *Pseudosquilla* à cause des épines mobiles du telson, avec *Squilla* et *Pseudosquilla* à cause de la forme des yeux et de la carapace, etc."

Distribution: Indo-West-Pacific region, from the Caroline Islands and from several localities in the western Indian Ocean.

Lysiosquilla maculata (Fabricius, 1793)

Squilla maculata Fabricius, 1793: 511.
Lysiosquilla maculata. — Kemp 1913: 111, pl. 8 figs. 86-91.

Material: Pacific Ocean: 2 ♂, 203-241 mm (in 2 lots). Réunion (de Saussure): 1 ♂, CL 30.6 mm. Réunion (Sikora): 1 ♂, 174 mm.

Distribution: Widely distributed in the Indo-West-Pacific region, from Japan to the western Indian Ocean.

Lysiosquilla scabricauda (Lamarck, 1818)

Squilla scabricauda Lamarck, 1818: 188.
Lysiosquilla scabricauda. — Manning, 1969*a*: 24, figs. 2-4, 5*a-b*.

Material: Cette (Lenoir): 1 ♂, 202 mm (erroneous locality).

Remarks: This single specimen, clearly identifiable with *L. scabricauda*, has been labelled as coming from Cette (Sète), France. No representative of this genus occurs in European waters.

Distribution: Western Atlantic region, from Bermuda to Brazil.

Family Squillidae Latreille, 1803

Cloridopsis scorpio (Latreille, 1828)

Squilla scorpio Latreille, 1828: 472. — Kemp 1913: 42, pl. 2 fig. 30.

Material: Mer des Indes (Naville): 4 specimens, 62-90 mm (in 2 lots).

Remarks: These specimens were determined as *scorpio* and were accompanied by the following note: "En diffèrent par la présence d'un petit tubercle sur les 2e-5e segments abdominales (sur la ligne médiane dorsale). Les dents du telson sont encore moins nombreuses que selon la descript. de Miers: *Ann. Mag. nat. Hist.* (5.V.18). Miers ne fait pas mention de la forme des dents terminales de la plaque interméd. du telson. Chez nos spécimens la dent int. est la plus longue et pourvue en dehors d'un petit lobe arrondi."

Distribution: Indo-West-Pacific region, from the western Pacific through the Indian Ocean.

Harpiosquilla harpax (De Haan, 1844)

Squilla harpax De Haan, 1844: pl. 51 fig. 1 [atlas]; 1849: 222 [text].
Harpiosquilla harpax. — Manning, 1969*b*: 25, figs. 28-38.

Material: Java (Zehntner): 4 ♂, 119-138 mm; 2 ♀, 114-153 mm.

Remarks: The male specimens, with carapace lengths ranging from 22.5-26.4 mm, have corneal indices ranging from 274-329. The females, carapace lengths 21.7 and

29.5 mm, have corneal indices of 297 and 311 mm. All but one specimen have 8 teeth on the claw; a male, TL 120 mm, has 8 on one side, 9 on the other. The intermediate carinae of the first abdominal somite are unarmed in all but one specimen.

Distribution: Indo-West-Pacific region, from Japan to the western Indian Ocean.

Harpiosquilla intermedia Manning and Michel, 1973

Harpiosquilla intermedia Manning and Michel, 1973: 113, figs. 1, 2*b*.

Material: Without locality (Pictet): 1 ♂, 165 mm; 1 ♀, 189 mm (in 2 lots).

Remarks: Both specimens represent the short-rostrum form described recently by Manning and Michel. Both unfortunately lack the claws, and both have the intermediate carinae of the first abdominal somite unarmed. The corneal index of the female, carapace length 39,2 mm, is 344.

Distribution: Known only from the type-locality, Baie de Ducos, New Caledonia.

Harpiosquilla raphidea (Fabricius, 1798)

Squilla raphidea Fabricius, 1798: 416. — Kemp 1913: 88 [part].
Harpiosquilla raphidea. — Manning 1969*b*: 9, figs. 4-9.

Material: Java (Zehntner): 1 ♀, 259 mm.

Remarks: This specimen, a typical *raphidea*, has a carapace length of 47.5 mm and a corneal index of 461.

Distribution: Indo-West-Pacific region, from Indonesia to the western Indian Ocean.

Meiosquilla desmaresti (Risso, 1816)

Squilla desmaresti Risso, 1816: 114, pl. 2 fig. 8. — Giesbrecht 1910: 25, pl. 1 figs. 6-7, pl. 3.

Material: Naples (Demole): 8 specimens, 31-65 mm (in 2 lots). Marseille (Roux): 2 specimens. Villefranche: 1 ♀, 54 mm. Without locality: 3 specimens.

Remarks: Only the specimen from Villefranche could be measured. That female, with a carapace length of 12.1 mm, has a corneal index of 448. There are 5-6 spines on the outer margin of the uropodal exopod.

Distribution: Mediterranean Sea and adjacent Atlantic, north to southern England.

Oratosquilla hesperia (Manning, 1968)

Squilla hesperia Manning, 1968: 25, fig. 8.
Oratosquilla hesperia. — Tirmizi and Manning, 1968: 43, fig. 17.

Material: Mauritius (Robillard): 1 ♂, 105 mm.

Remarks: This specimen, which had been identified with *O. nepa*, has the anterior lobe of the lateral process of the fifth thoracic somite bifurcated on one side. Zehntner added the following note: "affinis ad *nepa*, Latr. Ile Maurice. Robillard. Remarquable par le lobe lat. du 1er segm. thoracique libre, la dent antérieure étant bifide. Point de

sillon dorsal méd. sur aucun des segm. abdominales. La plaque rostrale est toute plane tandis que chez les autres individus de la même localité elle a les bords élevés. Carènes submédianes de l'abdomen se terminant en épine sur les 5e et 6e segm. seulement."

Zehntner was comparing this specimen with specimens of *O. juxtaoratoria*, also identified with *O. nepa*, from the same locality.

Distribution: Western Indian Ocean, from Madagascar northwards to Muscat and Aden.

Oratosquilla juxtaoratoria (Ward, 1942)

Squilla mauritiana Kemp, 1913: 66, 68. — Manning 1968: 28, fig. 9.
Squilla juxtaoratoria Ward, 1942: 55.
Oratosquilla mauritiana. — Manning 1971: 4 [key].

Material: Mauritius (Robillard): 1 specimen, 145 mm; 1 ♀, 163 mm (in 2 lots). Mauritius: 1 ♂, 121 mm; 1 ♀, 141 mm (in 2 lots).

Remarks: Zehntner also had identified these specimens with *O. nepa*, and compared them with the single specimen of that species, as follows: "Concernant les lobes latéraux des segments thoraciques, il faut être observé, que les deux branches de ces lobes sont très inégales, les antérieures étant très petites et aigües. Chez les spécimens des Indes orientales, les deux branches du 2e segm. libre sont à peu près égales."

Two of these specimens have but 5 teeth on the claw, although the claw of one, the female 141 mm long, appears to have been regenerating. That female also had the submedian carinae of the third abdominal somite armed. The corneal index (518) could be determined only for the dry specimen, 145 mm long; it has a carapace length of 31.1 mm.

L. B. Holthuis has pointed out to me that the name *mauritiana*, introduced by Kemp as a manuscript name under his account of *O. oratoria* (1913: 66), was introduced in synonymy and therefore is not available under the Code. The oldest available name for the species was introduced by Ward in 1942.

Distribution: Western Indian Ocean, where it is known only from Madagascar and Mauritius.

Oratosquilla nepa (Latreille, 1828)

Squilla nepa Latreille, 1828: 471. — Kemp 1913: 60, pl. 4 fig. 49.

Material: Mer des Indes (Naville): 1 specimen, ca. 114 mm.

Remarks: Zehntner had correctly identified this specimen. He compared it with the specimens of *O. hesperia* and *O. juxtaoratoria* from Mauritius which he believed to represent the same species. He noted: "Remarquable par la longueur des dents antérolatérales de la carapace, par la face dorsale de l'abdomen érosée et par les carènes submédianes de l'abdomen qui se terminent en épines sur les 3e-6e segments. Chez les spécimens de l'île Maurice, c'est le cas sur le 4e-6e (chez un seul individu, on remarque une dent sur le 3e, et seulement sur un côté). Dans la figure qui donne de *Haan* de *S. oratoria*, qui est identique avec *nepa* (Miers, *Ann. Mag. Nat. Hist.* (5 V. 25) ces épines se trouvent seulement sur les 5e et 6e segments."

Distribution: Indo-West-Pacific region, from the southwestern Pacific to the western Indian Ocean.

Squilla mantis (Linnaeus, 1758)
Figure 1

Cancer Mantis Linnaeus, 1758: 633. — Holthuis 1969: 221.
Squilla mantis. — Giesbrecht 1910: 25, pl. 1 figs. 1, 2, 9, pl. 2, pl. 5 figs. 43-60. — Forest 1973: SQUIL Squil 1, fig.

Material. — Venice (Moricand): 1 ♂, 150 mm. Messina (Fol): 1 specimen, 185 mm. Naples (Demole): 4 specimens, 53-130 mm (in 2 lots). Naples (Binder): 1 ♀, 132 mm. Gulf of Naples (Carl): 1 ♂, 142 mm. Genova (Bregy): 1 ♀, 121 mm. Nice (Lunel): 1 specimen, 162 mm. Villefranche: 3 ♂, 165-173 mm (in 2 lots). Sete (Brandily): 1 ♂, 130 mm; 1 ♀, 132 mm. Mediterranean: 1 specimen, 98 mm. Algeria (de Saussure): 1 spec., 143 mm.

Remarks: These specimens are of particular interest in that they demonstrate that there may be two distinct forms of *S. mantis* in the Mediterranean. Zehntner noted the differences and commented as follows on a specimen from Naples: "Ce crustacé

Table 1

Comparison of some morphological features of Squilla mantis *in the Muséum d'Histoire naturelle, Geneva*

Total Length (TL), in mm	Carapace Length (CL), in mm	Corneal Index (CI)	Rostral Plate Length/Width, in mm
A. Specimens with unarmed submedian carinae on fourth abdominal somite			
♂♂ 130	28.4	466	4.3/4.9
142	31.7	466	4.5/4.8
143	31.8	454	4.6/5.1
165	—	—	4.9/5.2
171	37.0	500	5.2/5.9
173	35.4	485	5.9/5.7
♀♀ 121	—	—	4.0/4.0
132	27.0	450	4.2/4.2
132	—	—	4.4/4.4
?? 110	25.4	—	4.2/4.0
162	—	—	5.6/5.2
185	—	—	7.0/6.0
B. Specimen with armed submedian carinae on fourth abdominal somite			
♂ 130	29.5	447	3.8/5.0

rapproché à *Squilla mantis*, Rondelet, s'en distingue par sa plaque rostrale abréviée et plus élargie proport que chez l'espèce citée. Aussi je trouve les carènes submédianes du 4e segm. abdom. se terminant en épine, ce que je n'ai pas remarqué que chex deux spécimens de tout notre matériel en *Squilla mantis*. Ces deux-là et les spécimens ci-dessus sont remarquables par la grande régularité sous les dents intermédianes du telson (Comp. le spécimen de l'Algérie)."

A single male from Naples, 130 mm long, differs from all of the other specimens in the collection in having the rostral plate markedly broader than long and in having armed submedian carinae on the fourth abdominal somite. The anterior part of the body, showing the short rostral plate, is illustrated in figure 1*d*. In contrast, the anterior portion of the body of another specimen from Naples, a male 142 mm long, is shown in figure 1*a*. In the latter specimen, the plate, although slightly broader than long, appears elongate. Some morphological features of the other specimens which could be measured are

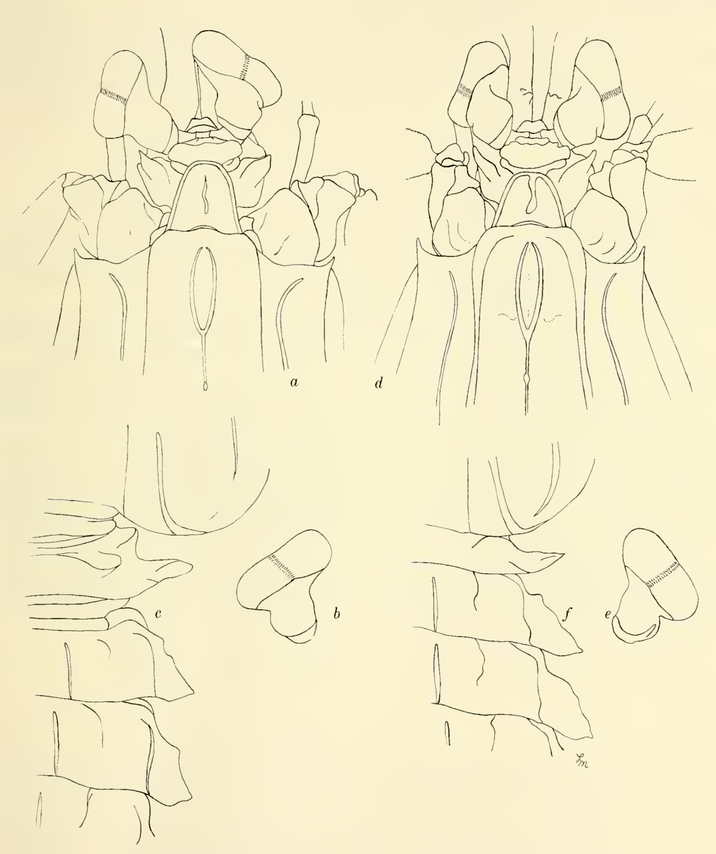


Fig. 1.

Squilla mantis (Linnaeus), Naples: *a*, *d*, anterior portion of carapace; *b*, *e*, eye: *c*, *f*, lateral processes of fifth, sixth, and seventh thoracic somites. *a-c*, male, 142 mm long, form with long rostral plate; *d-f*, male, 130 mm long, form with short rostral plate.

shown in table 1. Of these other specimens, six males had rostral plates which were slightly broader than long but which appeared to be elongate, as figured, three females had rostral plates with the length and width subequal, and three specimens, not sexed, had rostral plates longer than broad. In none of these 12 specimens were the submedian carinae of the fourth abdominal somites armed. The sample is very small, but the one unusual specimen suggests that perhaps two taxa are being confused under *Squilla mantis* at the present time. The possibility also exists, of course, that *S. mantis* is variable in these features. Additional material from throughout the range of *S. mantis* should be examined for these features.

The neotype of *S. mantis* (see Holthuis 1969: 221) has a rostral plate which is longer than broad and lacks spines on the submedian carinae of the fourth abdominal somite.

Distribution: Mediterranean Sea and adjacent North Atlantic, south off West Africa to the Gulf of Guinea.

Squilla prasinolineata Dana, 1852

Squilla Dufresnii White, 1847: 83 [*nomen nudum*].
Squilla prasinolineata Dana, 1852: 620; Atlas, 1855: 13 [listed], pl. 61 figs. 3a-c. — Manning, 1969*a*: 175, figs. 49, 50*a*.

Material: Cuba (de Saussure): 1 specimen. Without locality: 1 specimen, 103 mm. Erroneously labelled Mediterranean: 1 ♀, 90 mm.

Remarks: Each of these specimens was more or less tentatively identified with *S. dufresnii*, a synonym of *S. prasinolineata*, as indicated by the following notes:

With the specimen labelled Mediterranean: « Sur les carènules médianes dorsales des segments abdominales et par les lobes lat. de 2e et 3e segm. thoracique moins aiguës que chez *Sq. mantis*, ce crust. se rapproche à *Squilla Dufresnii*."

With the specimen from Cuba: "Par la forme des lobes lat. des segments thoraciques à cause des petites carènes médianes dorsales des segm. abdominales ce crust. se rapproche à *Dufresnii* Leach. Cuba. M. Hide Sauss. Voir aussi les 4 dents de la patte raptatoire. *Squilla mantis* en a 5." Presumably he did not include the terminal tooth in his count, for this species has 5 teeth, and *mantis* has 6.

With the specimen lacking locality data: "Ce crustacé répond très bien à *Squilla Dufresnii* Leach (voir Miers *Ann. Mag.* at 5. p. 18 pl. II fig. 8, 9. Je n'hésite pas de l'identifier avec cette espèce. Patrie inconnue."

Distribution: Western Atlantic, from southern Florida to Brazil.

LITERATURE CITED

Bigelow, R. P. 1893. Preliminary notes on the Stomatopoda of the Albatross collections and on other specimens in the National Museum. *Johns Hopk. Univ. Circ.* 12 (106): 100-102.

— 1894. Report on the Crustacea of the Order Stomatopoda collected by the Steamer Albatross between 1885 and 1891 and on other specimens in the U.S. National Museum. *Proc. U.S. natn. Mus.* 17: 489-550, figs. 1-28, pls. 20-22.

Borradaile, L. A. 1906. Stomatopoda from the Western Indian Ocean. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner. *Trans. Linn. Soc. London. Zool.* (2), 12: 209-216, pl. 22.

BROOKS, W. K. 1886. Report on the Stomatopoda collected by H.M.S. Challenger during the years 1873-76. *Rep. scient. Results Voy. Challenger, Zool.* 16: 1-116, pls. 1-16.

BRULLÉ, M. 1837-1839. Crustacés. *In:* Barker-Webb, P. & S. Berthelot. Histoire naturelle des îles Canaries. Zool., 2 (2) Entomologie: 13-18 (1839), atlas (1837), pl. unique. *Béthune, Paris.*

DANA, J. D. 1852. Crustacea. Part. I. United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842 under the command of Charles Wilkes, U.S.N., 13: 1-685. Atlas, 1855: 1-27, pls. 1-96. *C. Sherman, Philadelphia.*

DOLLFUS, R. PH. 1959. Stomatopoda (III). Mission Robert Ph. Dollfus en Egypte (Société Misr pour les pêcheries), XXX. *Result. scient. Miss. R. Ph. Dollfus en Egypte* 3: 241-245, figs. 9, 12, 24, 25.

FABRICIUS, J. C. 1781. Species Insectorum exhibentes eorum differentias specificas, synonymy auctorum, loca natalia, metamorphosin adjectis observationibus, descriptionibus, *Carol Ernest Bohnii,* 1: viii + 552.

— 1787. Mantissa Insectorum sistens eorum species nuper detectas adjectis characteribus genericis, differentiis specificis, emendationibus, observationibus, *Proft. Hafniae,* 1: xx + 348 pp.

— 1793. Entomologia systematica, emendata et aucta. Classes, ordines, genera, species adjectis synonimis, locis, observationibus, descriptionibus, *Proft. Hafniae,* 2: viii + 519.

— 1798. Supplementum Entomologiae systematicae *Proft Storch, Hafniae.* 572 pp.

FOREST, J. 1973. Crustaceans, 45 pp., figs. *In:* FISCHER, W., ed. FAO species identification sheets for fishery purposes. Mediterranean and Black Sea (fishing area 37), vol. 2: pag. var. *FAO, Rome.*

FORSKÅL, P. 1775. Descriptiones animalium, avium, amphibiorum, piscium, insectorum, vermium, *Moeller, Haonial*: 19, xxxii, 164 pp.

GIESBRECHT, W. 1910. Stomatopoden. Erster Theil. *Fauna Flora Golf Neapel,* 33: vii + 239, pls. 1-11.

HAAN, W. de, 1833-1850. Crustacea. *In*: SIEBOLD, P. F. von Fauna Japonica, sive descriptio animalium, quae in itinere per Japoniam, jussu et auspiciis superiorum, qui summum in India Batavia Imperium tenent, suscepto, annis 1823-1830 collegit, notis, observationibus et adumbrationibus illustravit: *A. Arnz, Lugduni Batavorum:* i-xvi, i-xxxi, vii-xvii, 1-243, pl. A-Q, 1-55, circ. 2.

HANSEN, H. J. 1895. Isopoden, Cumaceen und Stomatopoden der Planktonexpedition. *Ergebn. Plankton.-Exped.* 2 (Gc): 1-105, pls. 1-8.

HAUSER, B. 1972. Leo Zehntner: La saga d'un savant suisse. *Musées Genève,* no. 127: 2-5, figs. 1-2.

HOLTHUIS, L. B. 1941. Note on some Stomatopoda from the Atlantic coasts of Africa and America, with the description of a new species. *Zoöl. Meded. Leiden,* no. 23: 31-43, 1 fig.

— 1967. The stomatopod Crustacea collected by the 1962 and 1965 Israel South Red Sea Expeditions. The Second Israel South Red Sea Expedition, 1965. Report no. 1. *Israel J. Zool.* 16: 1-45, figs. 1-7.

— 1969. Indication of a neotype for *Cancer mantis* L., 1758 (Stomatopoda, Squillidae). *Crustaceana* 16 (2): 221-223.

INGLE, R. W. 1971. On the nomenclature of *Gonodactylus graphurus* White, 1847 (Nomen Nudum), Miers, 1875 (Stomatopoda, Gonodactylidae). *Crustaceana* 21 (2): 220-221.

KEMP, S., 1913. An account of the Crustacea Stomatopoda of the Indo-Pacific region based on the collection in the Indian Museum. *Mem. Indian Mus.* 4: 1-217, 10 text-figs., pls. 1-10.

LAMARK de, J. B. P. A. 1818. Histoire naturelle des animaux sans vertèbres, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères

essentiels de l'animal, sa distinction du végétal et des autres corps naturels, enfin, l'exposition des principes fondamentaux de la zoologie *Verdière, Paris,* 5: 612 pp.

LANCHESTER, W. F. 1903. Stomatopoda, with an account of the varieties of *Gonodactylus chiragra.* Marine Crustaceans, VIII, *In*: GARDINER, J. S. The fauna and geography of the Maldive and Laccadive archipelagoes, being the account of the work carried on and of the collections made by an expedition during the years 1899 and 1900. 1: 444-459, pl. 23.

LATREILLE, P. A. 1802-1803. Histoire naturelle, générale et particulière, des crustacés et des insectes *Dufart, Paris,* 3: 1-468.

— 1828. Squille, *Squilla. In:* Encyclopédie méthodique. Histoire naturelle..., 10: 467-475. *Agasse, Paris.*

LENZ, H. 1905. Ostafrikanische Decapoden und Stomatopoden, gesammelt von Herrn Prof. Dr. A. Voeltzkow. *Abh. senckenb. naturforsch. Ges.* 27: 341-392, pls. 47-48.

LINNÉ C. von. 1758. Systema naturae per regna tria naturae systematice proposita per classes, ordines, genera et species, cum characteribus, differentiis, synonymis, locis, ed. 10, 1: iii + 824. *Laur. Salvius, Holmiae.*

MAN, J. G. DE, 1888. Bericht über die von Herrn Dr. J. Bock im indischen Archipel gesammelten Decapoden und Stomatopoden. *Arch. Naturgesch.* 53 (1): 215-600, pls. 7-22a.

— 1902. Die von Herrn Professor Kükenthal im Indischen Archipel gesammelten Dekapoden und Stomatopoden. (Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo). *Abh. senckenb. naturforsch. Ges.* 25: 465-929, pls. 19-27.

MANNING, R. B., 1967*a*. Notes on the *demanii* section of genus *Gonodactylus* Berthold with descriptions of three new species (Crustacea, Stomatopoda). *Proc. U. S. natn. Mus.* 123 (no. 3618): 1-27, figs. 1-8.

— 1967*b*. A review of the genus *Odontodactylus* (Crustacea: Stomatopoda). *Proc. U. S. natn. Mus.* 123 (no. 3606): 1-35, figs. 1-8, pl. 1.

— 1968. Stomatopod Crustacea from Madagascar. *Proc. U. S. natn. Mus.* 124 (no. 3641): 1-61, figs. 1-16.

— 1969*a*. Stomatopod Crustacea of the Western Atlantic. *Stud. trop. Oceanogr.* 8: viii + 380, figs. 1-91.

— 1969*b*. A review of the genus *Harpiosquilla* (Crustacea, Stomatopoda), with descriptions of three new species. *Smithson. Contr. Zool.* No. 36: 1-41, figs. 1-43.

— 1969*c*. Notes on the *Gonodactylus* section of the family Gonodactylidae (Crustacea, Stomatopoda), with descriptions of four new genera and a new species. *Proc. biol. Soc. Wash.* 82: 143-166, figs. 1-8.

— 1971. Keys to the species of *Oratosquilla* (Crustacea: Stomatopoda), with descriptions of two new species. *Smithson. Contr. Zool.* No. 71: 1-16, figs. 1-4.

— 1972. Two new species of *Pseudosquilla* (Crustacea, Stomatopoda) from the Pacific Ocean. *Am. Mus. Novit.* no. 2484: 1-11, figs. 1-2.

— 1974. A new stomatopod crustacean from Mauritius. *Revue suisse Zool.* 81 (1): 69-72, fig. 1.

MANNING, R. B., & A. MICHEL, 1973. *Harpiosquilla intermedia*, a new stomatopod crustacean from New Caledonia. *Proc. biol. Soc. Wash.* 86 (9): 113-115, figs. 1-2.

MARTENS, E. von, 1881. Squilliden aus dem Zoologischen Museum in Berlin. *Sber. Ges. naturf. Freunde Berl.* 1881: 91-94.

MIERS, E. J. 1875, On some new or undescribed species of Crustacea from the Samoa Islands. *Ann. Mag. nat. Hist.* (4) 16: 341-344.

— 1880. On the Squillidae. *Ann. Mag. nat. Hist.*, (5) 5: 1-30, 108-127, pls. 1-3.

— 1884. On some crustaceans from Mauritius. *Proc. Zool. Soc. Lond.* 1884: 10-17, pl. 1.

MILNE-EDWARDS, A. 1869. Rade de Saint Vincent du Cap-Vert (supplement): 136-138, pl. 17. In: FOLIN, L. de & L. PERIER, 1867-1872, Les Fonds de la Mer 1: 1-316, pls. 1-32.

MÜLLER, F. 1886. Zur Crustaceenfauna von Trincomali. *Verh. naturf. Ges. Basel* 8: 470-479, pl. 4.

Pocock, R. I. 1893. Report upon the stomatopod crustaceans obtained by P. W. Bassett-Smith, Esq., surgeon, R. N., during the cruise, in the Australian seas, of H. M. S. Penguin, Commander W. U. Moore. *Ann. Mag. nat. Hist.* (6) 11: 473-479, pl. 20B.

Risso, J. A., 1816. Histoire naturelle des crustacés des environs de Nice: 1-175, pls. 1-3.

Roxas, H. A. & E. Estampador, 1930. Stomatopoda of the Philippines. *Nat. appl. Sci. Bull. Univ. Philipp.* 1: 93-131, pls. 1-6.

Schmitt, W. L. 1940. The stomatopods of the west coast of America based on collections made by the Allan Hancock Expeditions, 1933-1938. *Allan Hancock Pacif. Exped.* 5 (4): 129-225, figs. 1-33.

Serène, R. 1947. Sur les stomatopodes rares trouvés en Indochine et n'existant pas dans les collections du Muséum. *Bull. Mus. natn. Hist. Nat. Paris*, (2) 19 (5): 381-389, figs. 1-2, pls. 1-4.

— 1954. Observations biologiques sur les stomatopodes. *Mém. Inst. oceanogr. Nhatrang* 8: 1-93, figs. 1-15, pls. 1-10.

Tirmizi, N. M. & R. B. Manning, 1968. Stomatopod Crustacea from West Pakistan. *Proc. U. S. natn. Mus.* 125 (3666): 1-48, figs. 1-17.

Türkay, M. 1971a. Die Portunidae des Naturhistorischen Museums Genf, mit einem Anhang über die Typen von *Ovalipes ocellatus floridanus* Hay and Shore 1918 (Crustacea, Decapoda). *Archs. Sci. Genève* 24: 111-143.

— 1971*b*. Die Corystidae und Atelecyclidae des Naturhistorischen Museums Genf (Crustacea, Decapoda). *Revue suisse Zool.* 78: 227-230.

— 1974: Die Grapsidae: Grapsinae des Naturhistorischen Museums Genf, mit einer Bestimmungstabelle der rezenten Gattungen (Crustacea, Decapoda). *Rev. suisse Zool.* 81 (1): 137-148, figs. 1-2, pl. 1.

Ward, M. 1942. Notes on the Crustacea of the Desjardins Museum, Mauritius Institute, with descriptions of new genera and species. *Bull. Maurit. Inst.* 2 (2): 49-108, pls. 5-6.

White, A. 1847. List of the specimens of Crustacea in the collection of the British Museum: London. viii + 141.

— 1861. Descriptions of two species of Crustacea belonging to the families Callianassidae and Squillidae. *Proc. Zool. Soc. Lond.*: 43-44, pl. 7.

Wood-Mason, J. 1895. Figures and descriptions of nine species of Squillidae from the collection in the Indian Museum: 1-11, pls. 1-4. Calcutta.

Zehntner, L., 1894. Crustacés de l'Archipel Malais. *Revue suisse Zool.*, 2: 135-214, pls. 7-9.

Author's address:

Department of Invertebrate Zoology
National Museum of Natural History
Smithsonian Institution
Washington, D.C. 20560
USA